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ABSTRACT

This study assessed some of the cognitive and affective elements for both the traditional and mini curricula. The hypothesis, stated in the null form, was there will be no difference between students in the mini-course curriculum and the traditional curriculum on a number of stated cognitive variables (focusing on critical thinking and reading comprehension) and affective variables (focusing on attitudes toward social studies and teachers). Five hundred eleventh grade students from two comparable high schools served as the sample. Two cognitive and three affective instruments were administered on a classroom basis in the 1971-72 school year. Pre- and post-tests of all instruments except one were administered. Two-way analyses of variance with curriculum model (mini-traditional) and sex (male-female) as independent variables and the cognitive and affective measures as dependent variables were employed. Findings indicated that: 1) Males in the traditional curriculum made significantly greater gains on critical thinking and on vocabulary and level of comprehension; 2) Mini Curriculum students gained significantly on evaluation of arguments; 3) No differences in the amount of pre-post change in motivation toward education or in attitude toward school subjects was found; and, 4) In the post-test Mini curriculum students were found to have more positive attitudes toward teachers. (SJM)

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MINI VERSUS TRADITIONAL: AN EXPERIMENTAL STUDY OF HIGH SCHOOL SOCIAL STUDIES CURRICULA

By

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In spite of an unprecedented effort to initiate curricular reform in the public schools of the United States during the last fifteen years, educators are questioning whether or not there has been any real improvement in our nation's schools. Charles Silberman writing in Crisis in the Classroom, suggests that, "the reform movement has produced innumerable changes, and yet the schools themselves are largely unchanged." Both Silberman and John Goodlad, Dean of the UCLA Graduate School of Education, conclude from their studies that our schools are much the same as they were twenty years ago in spite of the greatest knowledge explosion in history.[1]

The reluctance to change established practice is not the only problem in our schools. Silberman, speaking for many, feels that the greatest weakness in American education is the failure to develop, "sensitive, autonomous, thinking, human individuals." We have done this by creating a false dichotomy between the "cognitive" and "affective" domains, between thinking and feeling. Men must be educated not only to think but also to feel. It is only through this combination of the two domains that man can apply what he has learned in order to create a more humane world. Without it he merely replicates the past.[2]

The integration of the cognitive and affective domains is based on sound psychological principles. Since the early part of the century educators have known that students are whole persons and that the affective domain cannot be separated from the cognitive. Students react to both subject matter and teachers emotionally as well as intellectually.[3]

Research has shown how various patterns of teacher affective behavior are related to student cognitive growth.[4] Studies have also demonstrated the expected reciprocal influence of student attitudes and performance; attitudes toward subject matter are found to be, at least moderately, related to achievement.[5] Although a complex issue, it does appear that favorable attitudes toward school subjects does maximize student learning and retention.

Obviously, no panacea exists which will interrelate the cognitive and affective domains. Cries for reform and "relevance" may resound throughout the schoolyard but only adequate theory and research will give us sound answers.

One recent curricular innovation that offers possible hope for the improvement of instruction at the secondary level, as well as a break from the lock-step Carnegie unit, is the mini-course. Mini-courses in essence, are short-term courses that are offered in a time period that is less than one semester in length.

The origin of the mini-course can be traced to the widespread student unrest at the end of the 1960's and the demand for more relevance in the curriculum. In the Spring of 1969 the students of Walt Whitman High School in Bethesda, Maryland, ran a one-week experiment in free form education during which there were no required classes, no grades, and no traditional class groupings. A list of 242 subjects was drawn up and 150 guest lecturers, including many of Whitman's most talented students, were asked to participate. Whitman students were then asked to sign up for the subjects they wished to study; these ranged from European archaeology to science fiction. Many of the "courses" were action-oriented. Students interned at local and regional planning offices, worked at newspapers, stores, or served as student aides in classes for the handicapped, helped U.S. senators with their mail and so forth.

It was from this experiment and similar variations on the theme that the mini-course movement was borne. This can accurately be called a grass roots curriculum development. Many teachers colleges have worked with practice teaching modules or minis in their training programs, but the subject matter orientation of the high school mini is original. No accurate census as yet has been taken to see how many high schools in the country have mini-courses but the authors are familiar with programs in New York, California, New Jersey, Massachusetts, Pennsylvania, and Connecticut. Twenty-eight Connecticut high schools in the Fall of 1971 reported that they were involved in some kind of mini-course program. This represents, roughly, 8% of the high schools in the state. Undoubtedly, there are large numbers of schools that are developing unpublicized programs. Interestingly, however, there are no published research studies other than student-opinion polls on the minis, and there is very little information about them in the professional literature.

The time allotted to mini-courses, thus far in their development, varies considerably. Some schools utilize mini-courses as a one or two week situation that may be tacked on to the existing curriculum. In some cases schools follow the Whitman model, while in others mini-courses are held at the end of the school year, the end of a semester, or a time block that is left unscheduled. Other schools see mini-courses as best suited to lunch periods, study halls, or in the period immediately at the end of the "normal" school day. An increasing number of schools, however, seem to be scheduling mini-courses in a nine or ten week block of time. In this arrangement the school year consists of four mini-sessions rather than the traditional two semesters.

A curriculum built on mini-courses is based on a far larger and usually far broader range of offerings than one based on either semesters or a one year block of time. It is not unusual for a single department, Social Studies for example, to offer as many as forty to fifty mini-courses as compared with seven or eight courses in the traditional setting. Students are given a great deal of freedom in choosing from this wide range of offerings.

Mini-courses offer a number of positive advantages that are both cognitive and affective in nature. In the cognitive realm, students have the opportunity to study a greater number of subjects in greater depth. It can be argued, for example, that many of the broad survey courses that are taught, notably in the social studies and English, are often superficial and redundant. By the time a student takes high school American history, to cite one example, he may have studied some of the content three or four times. A wide range of mini-courses offers the opportunity for challenging in-depth study of a particular subject. In areas where it is felt that there must be a common core, mini-courses can be used for enrichment. In either case, the curriculum offers more challenge and the opportunity for sophisticated study.

In the affective domain choice is a key word. Students choose at least four separate courses in which they are interested each year. Students can pick what they really need or want to know and can skip that which is unnecessary. This is a natural selection process which can be very healthy for the curriculum. Students literally vote for curriculum development with their choices. Subjects which are outmoded or irrelevant can be discarded, revised, or drastically altered. Basic process skills can still be taught in those subjects which remain.

Students also reap some fringe benefits. They may study with many different teachers, repeat only a quarter's work, not a full year's, if they fail a course, and choose work in areas where they need specialized help in developing skills.

Teachers have a rare opportunity to involve students in their own learning. Students may assist in the creation of courses in which they are interested, or quite possibly teach a course if they have a unique ability. Teacher-pupil cooperation is especially apropos if a major affective outcome that we seek is a change in both student and teacher attitudes. School should be a place of involvement, not a prison for a captive audience. As Ohme has suggested, this is what "relevance" is all about--the creation of a desire to learn through individual involvement and responsibility.[6]

It will be argued by some people that high school students already have the right to choose their curriculum, but once the college-bound student has met the traditional college prerequisites, he has very little room left for choice. We know from Piaget that the child is the principal agent in his own education and mental development. Mini-courses can broaden students' experience and give them the opportunity to do things that they normally would not do. Students who study what they are interested in can also be legitimately responsible for how well they do--more so than a student who is a prisoner of a set curriculum.

Teachers are also given a rare opportunity in a curriculum which is based on mini-courses. Most college and university education is based on highly specialized courses. The average teacher rarely gets a chance to teach either

what he really knows or what he is really interested in. By specializing, teachers have an opportunity to display their talents rather than just cover large blocks of general material. Not only can they utilize their subject matter competency, but also select courses that reflect their special interests as well. Thus, for student and teacher alike the opportunity "to do their thing" is there but without the flabbiness that this catch phrase often connotes since the structure and rigor of a subject matter field are still maintained.

Affect as it relates to teachers should not be minimized. Curriculum developers have learned the lesson in recent years that curriculum change has little chance unless teachers are interested in innovation, and willing to try and see it as important. There is no such thing as a "teacher proof" curriculum. Teacher interest, needs and motivation must all be taken into consideration if there is to be real improvement in the curriculum.

The limited evidence thus far suggests a positive attitude toward the mini-course curriculum:

> This is the first time I've ever taught kids who wanted to be in my subject . . . All of us were surprised by which students signed up for what courses (sic). Freed from the stigma of homogeneous grouping, many of our not-bound-for-college seniors elected to the more intellectual mini-courses. Used to their apathetic performance in general classes we were amazed by their sophisticated handling of difficult subjects in mixed discussion groups. They sometimes outdid the brightest seniors in their penetrating observations about Bergman's The Virgin Spring or his Smiles of a Summer Night.[7]

Westfield, New Jersey, reports that a curriculum combining nine and eighteen week courses in the social studies has been favorably received by its student body. Students found no difficulty in changing to the new curriculum; many were able to get to know their teachers better; roughly a third got higher grades; and more than 75% rated the program as above average or excellent.[8]

Finally, the mini-course also offers some general curricular possibilities. Traditional departmental lines which are often more difficult to breach at the high school level than at the college level may take on less importance. Minis

which start in one department end up in another as teachers discuss and work together on their interests. There is reason to believe that there is less emphasis on grades in a mini-course curriculum. People are studying what they are interested in and grades are not as important. This condition may well lead to a blurring of the traditional teacher-learner concept as the two groups work in a climate of real interest, talent and enthusiasm.

All of these real or hoped for advantages, of course, assume that mini-courses are more than year-long courses broken down into four quarters. There are other real and potential disadvantages as well. Teachers may try to compress too much into a mini. The result could well be an extensive tobacco auction.

Scheduling can be a major problem, especially when a school first attempts a mini-course program. This can be overcome as the successful operations of several schools illustrate. Computer assistance is helpful to this end. Schools report initial success of 85-90% of students computer scheduled the first time through. Experience can and does improve this situation.

Another possbile disadvantage is the large number of preparations that a teacher may have during a session and/or a school year. If truly based on interest, this would not be a great problem, but if teachers are arbitrarily assigned to sections that they must teach, then, mini-courses could be more of a burden than the traditional semester or year-long course. Some teachers also fear that they may not get to know their students as well as in the longer time block but others who have taught mini-courses argue vehemently that this is not so.

The major criticism of the mini-course curriculum that can be currently offered is that it has not been adequately evaluated. Before the mini-course curriculum bandwagon rolls too far, does it in fact fulfill its promise?

One must ask about the cognitive aspects of the new curriculum. We do not seek to create highly motivated idiots. Are there significant gains in cognitive skills after one has been exposed to mini-courses? Certainly we would expect the gain to at least equal the gains achieved under the traditional curriculum. But what cognitive skills does one evaluate? Traditional comparisons of achievement performance are not a viable approach as the two curricula do

not contain identical content. In addition, there are other significant questions that need answering before meaningful curriculum comparisons can be made. For example, does exposure to a greater variety of subject matter help the individual to develop the ability to define a problem, select pertinent information for the solution of a problem, recognize stated and unstated assumptions, formulate and select relevant and promising hypotheses, draw conclusions validly, and judge the validity of inferences? Watson and Glaser have defined these statements as the ability to think critically.[9] It is also resonable to expect that the new method should generate skill development in other areas besides critical thinking. Since vocabulary building, reading comprehension, and reading speed are important indicators and prerequisites for future academic success, they too should be evaluated.[10]

The limited number of practitioners who have been involved in teaching in a mini-course curriculum are quite willing to give testimony to positive changes in attitudes on the part of students. Students are thought to enjoy the subject matter that they are studying to a greater degree than the traditional curriculum model. Is this, in fact, a reality or simply enthusiasm for something that is new? Research is clearly needed which seeks answers to such questions as: Do students experiencing a mini-course show greater pre-post year changes in attitude toward subject matter,[11] or motivation to learn[12] than students experiencing the traditional model? Also, do mini-course students have higher end-of-the-year attitudes toward teachers than a comparable group of traditional course students?

In light of the above review, the following hypotheses are advanced in the null form for purposes of statistical analysis:

Ho There will be no difference between students in the mini-course curriculum and the traditional curriculum on the following dependent variables:

<u>Cognitive</u>

Critical Thinking

1. Inferences
2. Recognition of Assumptions
3. Deduction

4. Interpretation
5. Evaluation of Arguments
6. Total Critical Thinking

Reading Comprehension

7. Vocabulary
8. Level of Comprehension
9. Speed of Comprehension
10. Total Reading

Affective

11. Motivation Toward Education

Attitude Toward Social Studies

12. General Interest
13. Usefulness
14. Total Attitude Toward Social Studies

Attitude Toward Teachers

15. Presentation of Subject
16. Interest in Job
17. Teaching Techniques
18. Total Attitude Toward Teaching

METHODS AND PROCEDURES

Sample. The sample consisted of 500 eleventh grade students from two comparable high schools in a small city of approximately 46,000 people. The community served by these schools is essentially white middle class (both blue and white collar). There is no evidence to indicate that the two schools differ significantly on any selection variable.

Instruments. The Watson-Glaser Critical Thinking Appraisal was used to obtain a total critical thinking score as well as scores in the following areas: Inference, Recognition of Assumptions, Deduction, Interpretation, and Evaluation of Arguments. The second cognitive measure employed was the Cooperative English Tests-Reading Comprehension which yields scores on Vocabulary, Level of Comprehension, Speed of Comprehension and Total Reading.

In the affective area the first measure used was Frymier's JIM Scale Student Questionnarie, a single score instrument, which measures motivation

toward education. Reliability and validity data are supportive; scores on the instrument have been found to discriminate between overachievers and underachievers.[14]

The Gable and Roberts Attitude Toward School Subjects (GRASS) measure was also used to measure student attitude toward Social Studies. This 23 item Likert instrument yields a total score as well as scores on two dimensions of attitude toward social studies: general interest in the subject and usefulness to students. A description of the results of an examination of the content and construct validity (factor analysis) of this measure, as well as the internal consistency reliabilities, which were found to be .95, .94, and .70 respectively, is reported elsewhere.[15]

The final affective measure employed was the Roberts and Gable Attitude Toward Teachers Scale (RGATS). This 22 item Likert scale measure yields a total Attitude Toward Teacher score as well as scores on Presentation of Subject, Interest in Job, and Teaching Techniques, all of which were derived through factor analysis. Alpha internal consistency reliabilities were found to be .92, .86, .85, and .80 respectively.

Analysis. All instruments except the RGATS were administered on a large group or classroom basis in September and June of the 1971-72 school year. Since the students may not have formed attitudes toward some teachers early in September, the RGATS was given as a post-test only.

Two-way analyses of variance with curriculum model (mini-traditional) and sex (male-female) as independent variables and the cognitive and affective measures as dependent variables were employed. Since there were several cases of missing data in this pre-post test design, data analysis was carried out using pre-post change scores for complete sets of data.

RESULTS AND DISCUSSION

The results of the data analysis will be presented and discussed in two sections: Cognitive and Affective.

Cognitive

Table 1 presents the pre-post measure and standard deviations for the Mini and Traditional groups on the Watson-Glaser Critical Thinking Appraisal. Analyses of variance on the pre test data indicated that there were no initial difference between the two groups in these areas of critical thinking ability:

Tables 2 -7 present the change score means and standard deviations by sex and curriculum as well as the results of the two-way analyses of variance on the pre-post change scores for the Watson-Glaser total score and sub-scales Table 2 indicates that there was a significant interaction between sex and curriculum on the Inference scale. Greater pre-post gains in the ability to make inferences were made by males in the traditional curriculum. Figure 1 illustrates this interaction for the change scores. While Tables 3 - 5 indicate that no differences were manifest on the Recognition of Assumptions, Deduction, and Inferences scales, Table 6 indicates that students in the mini curriculum gained significantly ($p < .05$) more than those in the traditional curriculum in Evaluation of Arguments. No differences were found for the total Watson-Glaser Critical Thinking score (see Table 7).

Table 8 presents the pre-post means and standard deviations for the mini and traditional groups on the Cooperative English Tests-Reading Comprehension section. Analyses of variance indicated that no pre test differences existed between the Mini and Traditional groups. Tables 9 - 12 present the mean changes and analyses of variance for the Vocabulary, Level of Comprehension, Speed of Comprehension and Total Reading scores by sex and curriculum. Tables 9 and 10 indicate that the Traditional curriculum students gained significantly more on Vocabulary and Level of Comprehension than the Mini curriculum students ($p < .05$). While there were no differences between the two curriculum groups on Speed of Comprehension and Total Reading (Tables 11 - 12), females did gain significantly more than males on Level of Comprehension, Speed of Comprehension and Total Reading ($p < .05$; Tables 10— 12).

Affective

Table 13 presents the pre-post test means and standard deviations for the Mini and Traditional groups on the JIM Scale Student Questionnaire. Analysis

of variance on the pre test scores did indicate that the Mini students had significantly higher motivation toward education scores than the Traditional group; the same was found to be the case for the post test data. When the pre-post change scores were analyzed, no differences between the two curricula groups were found in motivation toward education. Table 14 contains the mean changes by sex and curriculum and the analysis of variance results. Although the Traditional groups did gain more than the Mini groups, the gains were not statistically significant.

Table 15 contains the pre-post test means and standard deviations for the Mini and Traditional groups on the General Interest, Usefulness and Total Attitude toward Social Studies scales from the GRASS measure. Analysis of variance for the pre test data indicated that the Traditional group scored significantly higher than the Mini group in the Usefulness and Total Attitude areas.

Tables 16 - 18 contain the mean changes by sex and curriculum and analyses of variance for the General Interest, Usefulness and Total Attitude Toward Social Studies areas. Inspection of the table entries suggests that although initial differences were found in favor of the Traditional group on the pre test, no significant curriculum or sex differences in the amount of change in attitude were found on any of the Gable and Roberts Attitude Toward School Subjects scales.

Table 19 contains the post-only means and standard deviations for the student attitude toward teacher scores on the Roberts and Gable Attitude Toward Teachers Scale. Note that scores were obtained for the Mini curriculum group at the end of each of the four Mini curriculum quarters and in June for the Traditional curriculum group. Inspection of the means for the four mini quarters suggests relatively small differences in Attitudes toward Teachers across the four quarters. Of particular importance are the comparisons between the fourth quarter Mini scores and the scores for the Traditional group. The t values listed in Table 19 indicate that the Mini curriculum students rated their teachers

significantly higher on Presentation of Subject, Interest in Job, and Teaching Techniques than the Traditional students. Mini students also indicated a significantly higher total Attitude Toward Teacher than the Traditional students. It should be noted, however, that problems of missing data and the possibility of initial differences between the two groups in this attitude area make this finding quite tentative.

SUMMARY AND CONCLUSIONS

In summary, for the cognitive area males in the Traditional curriculum made significantly greater gains on the Watson-Glaser Inference side; Mini curriculum students gained significantly more than Traditional students on Evaluation of Arguments. With respect to Reading Comprehension, Traditional curriculum students gained more than Mini curriculum students on Vocabulary and Level of Comprehension.

In the affective area, no differences in the amount of pre-post change in Motivation Toward Education was found between the two groups on the JIM Scale Student Questionnaire; no differences were found in the amount of change in attitude toward social studies between the two groups on the Gable and Roberts Attitude Toward School Subjects side. Finally, significantly greater June scores were found for the Mini curriculum students in total Attitude Toward Teachers, Presentation of Subject, Interest in Job and Teaching Techniques on the Roberts and Gable Attitude Toward Teachers Scale.

It can be concluded that there may be some advantage to the Mini-course curriculum model in the critical thinking ability area of evaluation of arguments. But the increased exposure to a variety of course offerings did not produce expected gains in Reading Comprehension; the Traditional curriculum model was associated with greater gains in this area. The expected greater increase in both motivation toward education and attitudes toward social studies was not found for the students in the Mini curriculum, but Mini curriculum students were found to have higher attitudes toward teachers.

This study was a first effort to assess some of the cognitive and affective elements of a new curriculum design. The results indicate areas of strength for both the Traditional and Mini Curricula. These results, however, suggest questions which demand further research. This study should be replicated under conditions of controlled experimentation after the program has been in existence for more than one year in order to discover more about the direction that this new innovation is taking. Only then can practioners have a clear understanding of its ultimate worth.

Table 1

Pre-Post Test Means and Standard Deviations
by Sex and Curriculum for
Watson-Glaser Critical Thinking Appraisal

		Traditional				Mini			
		Pre		Post		Pre		Post	
		$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
Inference		9.1	2.8	11.0	9.9	9.3	3.0	9.3	3.4
	M	8.8	2.9	10.5	8.8	9.0	3.2	8.9	3.4
	F	9.2	2.8	11.3	10.9	9.7	2.8	9.7	3.3
Recognition of Assumptions		9.5	3.3	10.5	3.2	9.9	3.0	10.7	3.2
	M	9.8	3.3	10.7	2.9	9.7	2.8	10.6	3.0
	F	9.3	3.3	10.3	3.6	10.0	3.2	10.8	3.3
Deduction		16.1	3.2	16.0	3.6	16.0	3.3	16.1	3.6
	M	15.7	3.4	16.2	3.8	15.8	3.6	15.2	3.9
	F	16.3	3.1	15.9	3.4	16.2	3.1	16.9	3.1
Interpretation		15.2	3.7	14.5	5.3	15.8	3.5	15.7	4.1
	M	15.2	3.6	14.3	5.4	15.4	3.6	15.2	4.4
	F	15.1	3.8	14.6	5.3	16.1	3.4	16.2	3.6
Evaluation of Arguments		8.2	2.8	7.4	6.5	8.1	2.4	8.4	2.7
	M	8.3	2.4	7.6	3.2	8.3	2.3	8.2	2.5
	F	8.1	3.0	7.3	8.3	7.8	2.3	8.6	2.9
Total		58.0	10.3	57.6	12.6	59.0	10.1	60.2	11.7
	M	57.8	9.5	58.1	13.1	58.1	9.9	58.2	12.1
	F	58.1	10.8	57.2	12.3	59.7	10.1	62.1	11.1

Figure 1

Sex by Curriculum Interaction
for Pre-Post Change Scores on the
Watson-Glaser Inference Scale

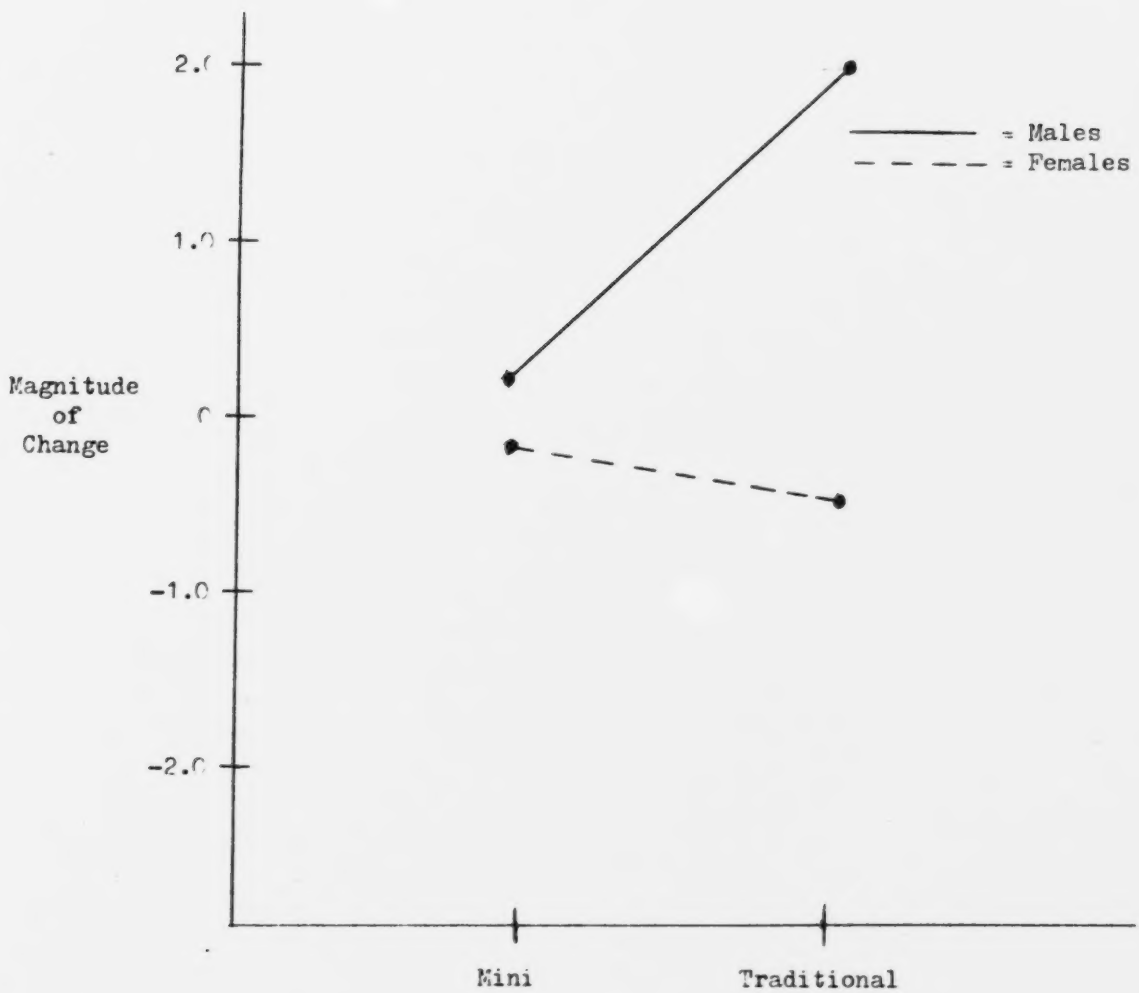

Table 2

Means, Standard Deviations and Analysis of Variance for Pre-Post Change Scores on Watson-Glaser: Inference

		Traditional	Mini	Total
Males	N	43	113	156
	$\bar{X}$	2.0	.1	.6
	SD	9.9	3.7	6.1
Females	N	56	126	182
	$\bar{X}$	-.4	.1	-.1
	SD	3.5	2.9	3.1
Total	N	99	239	338
	$\bar{X}$	.6	.1	.2
	SD	7.1	3.3	4.7

Analysis of Variance
Source Table

Source	df	SS	MS	F
Curriculum	1	38.0	38.0	1.7
Sex	1	106.4	106.4	4.8*
Sex X Curriculum	1	105.2	105.2	4.7*
Error	334	7404.5	22.2	

*$p < .05$

Table 3

Means, Standard Deviations and Analysis of Variance for Pre-Post Change Scores on Watson-Glaser: Recognition of Assumptions

		Traditional	Mini	Total
Males	N	43	113	156
	$\bar{X}$	.9	.5	.6
	SD	3.5	3.4	3.4
Females	N	55	126	181
	$\bar{X}$	1.5	.8	1.0
	SD	4.1	3.7	3.8
Total	N	98	239	337
	$\bar{X}$	1.2	.7	.8
	SD	3.9	3.6	3.6

Analysis of Variance
Source Table

Source	df	SS	MS	F
Curriculum	1	17.8	17.8	1.3
Sex	1	14.4	14.4	1.1
Sex X Curriculum	1	1.3	1.3	.1
Error	333	4408.5	13.2	

Table 4

Means, Standard Deviations and Analysis of Variance for Pre-Post Change Scores on Watson-Glaser: Deduction

		Traditional	Mini	Total
Males	N	43	113	156
	$\bar{X}$	.6	-.4	-.1
	SD	4.3	4.5	4.5
Females	N	55	126	181
	$\bar{X}$	-.0	.5	.4
	SD	3.7	3.2	3.4
Total	N	98	239	337
	$\bar{X}$	.3	.1	.1
	SD	3.9	3.9	3.9

Analysis of Variance
Source Table

Source	df	SS	MS	F
Curriculum	1	3.4	3.4	.2
Sex	1	1.4	1.4	.1
Sex X Curriculum	1	44.5	44.5	2.9
Error	333	5088.3	15.3	

Table 5

Means, Standard Deviations and Analysis of Variance for Pre-Post Change Scores on Watson-Glaser: Interpolation

		Traditional	Mini	Total
Males	N	43	113	156
	$\bar{X}$	-1.1	.2	-.2
	SD	6.2	3.9	4.7
Females	N	56	126	182
	$\bar{X}$	-.4	.2	-.0
	SD	5.8	3.7	4.4
Total	N	99	239	338
	$\bar{X}$	-.7	.2	-.1
	SD	5.9	3.8	4.5

Analysis of Variance
Source Table

Source	df	SS	MS	F
Curriculum	1	59.1	59.1	2.9
Sex	1	7.0	7.0	.3
Sex X Curriculum	1	7.4	7.4	.4
Error	334	6856.7	20.5	

Table 6

Means, Standard Deviations and Analysis of Variance for Pre-Post Change Scores on Watson-Glaser: Evaluation of Arguments

		Traditional	Mini	Total
Males	N	43	113	156
	$\bar{X}$	-.8	.2	-.1
	SD	3.9	2.6	3.1
Females	N	56	126	182
	$\bar{X}$	-.8	.8	.3
	SD	9.5	3.1	5.9
Total	N	99	239	338
	$\bar{X}$	-.8	.6	.2
	SD	7.6	2.9	4.8

Analysis of Variance
Source Table

Source	df	SS	MS	F
Curriculum	1	128.0	128.0	5.6
Sex	1	6.6	6.6	.3
Sex X Curriculum	1	5.3	5.3	.2
Error	334	7581.3	22.7	

Table 7

Means, Standard Deviations and Analysis of Variance for Pre-Post Change Scores on Watson-Glaser: Total Critical Thinking

		Traditional	Mini	Total
Males	N	43	113	156
	$\bar{X}$	.2	.8	.6
	SD	12.4	9.4	10.3
Females	N	55	126	181
	$\bar{X}$	-.6	2.3	1.4
	SD	11.2	8.4	9.4
Total	N	98	239	337
	$\bar{X}$	-.3	1.6	1.0
	SD	11.7	8.9	9.8

Analysis of Variance
Source Table

Source	df	SS	MS	F
Curriculum	1	213.1	213.1	2.2
Sex	1	11.5	11.5	.1
Sex X Curriculum	1	94.4	94.4	1.0
Error	333	31994.1	96.1	

Table 8

Pre-Post Test Means and Standard Deviations
by Sex and Curriculum for
Cooperative English: Reading Comprehension

		Traditional				Mini			
		Pre		Post		Pre		Post	
		$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
Vocabulary		34.2	8.8	35.7	9.7	34.6	8.2	35.6	8.4
	M	35.0	7.7	36.3	8.6	34.9	7.8	35.3	8.3
	F	33.7	9.4	35.3	10.4	34.4	8.5	36.9	8.5
Level of Comprehension		21.4	6.7	22.6	7.6	21.9	5.2	22.0	6.6
	M	21.2	5.5	21.3	7.1	21.5	5.8	20.7	7.4
	F	21.5	7.4	23.5	7.8	22.3	4.6	23.2	5.4
Speed of Comprehension		32.1	11.4	34.5	12.4	34.1	10.4	36.1	12.9
	M	31.5	9.3	32.9	13.4	33.4	10.9	33.6	13.7
	F	32.4	12.3	35.6	11.5	34.8	9.8	38.5	11.6
Total Reading		152.8	31.0	152.6	15.6	151.6	8.3	153.2	9.7
	M	150.5	7.3	151.2	14.2	151.3	8.4	151.9	9.5
	F	154.1	38.5	153.7	16.5	151.8	8.2	154.4	9.7

Table 9

Means, Standard Deviations and Analysis
of Variance for Pre-Post Change Scores on
Cooperative English: Vocabulary

		Traditional	Mini	Total
Males	N	95	125	220
	$\bar{X}$	2.5	.6	1.4
	SD	5.6	5.4	5.6
Females	N	129	135	264
	$\bar{X}$	2.2	1.5	1.8
	SD	9.3	5.3	7.5
Total	N	224	260	484
	$\bar{X}$	2.3	1.1	1.7
	SD	7.9	5.3	6.7

Analysis of Variance
Source Table

Source	df	SS	MS	F
Curriculum	1	195.8	195.8	4.4*
Sex	1	10.3	10.3	.2
Sex X Curriculum	1	46.2	46.2	1.0
Error	480	21296.7	44.4	

* $p < .05$

Table 10

Means, Standard Deviations and Analysis of Variance for Pre-Post Change Scores on Cooperative English: Level of Comprehension

		Traditional	Mini	Total
Males	N	95	125	220
	$\bar{X}$	1.6	-.9	.2
	SD	5.3	5.8	5.8
Females	N	129	135	264
	$\bar{X}$	2.6	1.0	1.8
	SD	8.6	4.3	6.7
Total	N	224	260	484
	$\bar{X}$	2.2	.1	1.1
	SD	7.4	5.2	6.4

Analysis of Variance
Source Table

Source	df	SS	MS	F
Curriculum	1	489.5	489.5	12.6*
Sex	1	240.4	240.4	6.2*
Sex X Curriculum	1	23.2	23.2	.6
Error	480	18721.1	39.0	

* $p < .05$

Table 11

Means, Standard Deviations and Analysis of Variance for Pre-Post Change Scores on Cooperative English: Speed of Comprehension

		Traditional	Mini	Total
Males	N	95	125	220
	$\bar{X}$	2.5	.7	1.5
	SD	10.8	9.7	10.2
Females	N	129	135	264
	$\bar{X}$	4.6	3.8	4.2
	SD	9.2	6.5	7.9
Total	N	224	260	484
	$\bar{X}$	3.7	2.3	3.0
	SD	10.0	8.3	9.1

Analysis of Variance
Source Table

Source	df	SS	MS	F
Curriculum	1	186.4	186.4	2.3
Sex	1	812.8	812.8	10.0*
Sex X Curriculum	1	29.8	29.3	.4
Error	480	39072.5	81.4	

* $p < .05$

Table 12

Means, Standard Deviations and Analysis of Variance for Pre-Post Change Scores on Cooperative English: Total Reading

		Traditional	Mini	Total
Males	N	95	124	219
	$\bar{X}$	1.8	.9	1.3
	SD	13.2	5.7	9.7
Females	N	128	135	263
	$\bar{X}$	4.2	2.7	3.4
	SD	17.1	7.2	13.0
Total	N	223	259	482
	$\bar{X}$	3.2	1.8	2.5
	SD	15.6	6.6	11.7

Analysis of Variance
Source Table

Source	df	SS	MS	F
Curriculum	1	166.7	166.7	1.2
Sex	1	524.5	524.5	3.9*
Sex X Curriculum	1	8.9	8.9	.1
Error	478	64657.8	135.3	

* $p < .05$

Table 13

Pre-Post Test Means and Standard Deviations
by Sex and Curriculum for Jim Scale
Student Questionnaire: Motivation Toward Education

		Traditional				Mini			
		Pre		Post		Pre		Post	
		$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
Jim		110.7	23.4	113.8	16.3	117.2	19.0	118.8	21.2
	M	107.7	23.2	110.6	15.5	112.0	18.9	112.6	23.1
	F	112.5	23.6	116.4	16.5	121.9	17.9	124.0	17.8

Table 14

Means, Standard Deviations and Analysis of Variance for Pre-Post Change Scores on Jim Scale: Motivation Toward Education

		Traditional	Mini	Total
Males	N	50	115	165
	$\bar{X}$	6.5	2.8	3.9
	SD	16.2	20.1	19.0
Females	N	90	134	224
	$\bar{X}$	5.0	1.4	2.8
	SD	18.3	15.3	16.6
Total	N	140	249	389
	$\bar{X}$	5.5	2.0	3.3
	SD	17.5	17.7	17.7

Analysis of Variance
Source Table

Source	df	SS	MS	F
Curriculum	1	1119.2	1119.2	3.6
Sex	1	173.7	173.7	.6
Sex X Curriculum	1	.4	.4	.0
Error	385	119947.0	311.6	

Table 15

Pre-Post Test Means and Standard Deviations
by Sex and Curriculum for
Gable-Roberts Attitude Toward School Subjects: Social Studies

		Traditional				Mini			
		Pre		Post		Pre		Post	
		$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
General Interest		33.6	4.2	33.5	2.9	33.2	4.2	32.8	2.8
	M	33.4	2.7	33.4	2.9	32.5	3.1	33.6	3.2
	F	33.7	4.8	33.5	3.0	33.9	4.8	32.4	2.6
Usefulness		14.9	3.7	14.6	2.9	14.0	2.1	14.5	2.1
	M	14.6	2.2	14.9	3.5	14.1	2.2	14.3	1.9
	F	15.0	4.3	14.4	2.3	13.9	2.1	14.7	2.2
Total		48.[illegible]	4.7	48.0	4.0	47.1	3.8	47.3	3.7
	M	48.1	3.5	48.0	3.9	46.7	3.9	47.8	4.1
	F	48.0	5.3	48.0	4.2	47.5	3.7	47.1	3.5

Table 16

Means, Standard Deviations and Analysis
of Variance for Pre-Post Change Scores on
Gable-Roberts Attitude Toward School Subjects: General Interest

		Traditional	Mini	Total
Males	N	81	25	106
	$\bar{X}$	.2	.8	.3
	SD	4.7	3.3	4.3
Females	N	110	50	160
	$\bar{X}$	-.0	-.9	-.3
	SD	3.5	2.9	3.3
Total	N	191	75	266
	$\bar{X}$	.1	-.3	-.0
	SD	4.0	3.1	3.8

Analysis of Variance
Source Table

Source	df	SS	MS	F
Curriculum	1	.8	.8	.1
Sex	1	42.8	42.8	3.0
Sex X Curriculum	1	25.9	25.9	1.8
Error	262	3793.9	14.5	

Table 17

Means, Standard Deviations and Analysis
of Variance for Pre-Post Change Scores on
Gable-Roberts Attitude Toward School Subjects: Usefulness

		Traditional	Mini	Total
Males	N	81	25	106
	$\bar{X}$	.1	.2	.2
	SD	2.8	2.6	2.7
Females	N	110	50	160
	$\bar{X}$	-.2	.7	.1
	SD	2.5	2.7	2.6
Total	N	191	75	266
	$\bar{X}$	-.0	.5	.1
	SD	2.6	2.6	2.6

Analysis of Variance
Source Table

Source	df	SS	MS	F
Curriculum	1	10.8	10.8	1.6
Sex	1	.3	.3	.0
Sex X Curriculum	1	6.5	6.5	1.0
Error	262	1797.3	6.9	

Table 18

Means, Standard Deviations and Analysis of Variance for Pre-Post Change Scores on Gable-Roberts Attitude Toward School Subjects: Total Attitude Toward Social Studies

		Traditional	Mini	Total
Males	N	81	25	106
	$\bar{X}$	.5	1.0	.7
	SD	5.1	4.6	4.9
Females	N	110	50	160
	$\bar{X}$	.0	.0	.0
	SD	4.9	3.8	4.5
Total	N	191	75	266
	$\bar{X}$	.2	.4	.3
	SD	4.9	4.1	4.7

Analysis of Variance
Source Table

Source	df	SS	MS	F
Curriculum	1	3.3	3.3	.2
Sex	1	27.8	27.8	1.2
Sex X Curriculum	1	3.0	3.0	.1
Error	262	5836.7	22.3	

Table 19

Means, Standard Deviations and t values for Post Test Scores on Roberts and Gable Attitude Toward Teacher Scale: Presentation of Subject, Interest in Job, Teaching Techniques, Total Attitude Toward Teacher

	$\bar{X}$	SD	
Mini 1 (N=413)			
Presentation of Subject	27.3	5.3	
Interest in Job	24.9	4.3	
Teaching Techniques	19.9	3.6	
Total Attitude Toward Teacher	72.0	11.7	
Mini 2 (N=308)			
Presentation of Subject	27.9	5.1	
Interest in Job	25.4	4.2	
Teaching Techniques	20.9	3.9	
Total Attitude Toward Teacher	74.3	11.7	
Mini 3 (N=201)			
Presentation of Subject	26.7	5.6	
Interest in Job	24.3	4.6	
Teaching Techniques	20.7	4.0	
Total Attitude Toward Teacher	72.2	12.6	
Mini 4 (N=185)			
Presentation of Subject	27.7	5.5	t=5.75*
Interest in Job	24.9	5.0	t=4.1*
Teaching Techniques	20.6	4.4	t=5.2*
Total Attitude Toward Teacher	73.2	13.5	t=5.7*
Traditional (N=309)			
Presentation of Subject	24.5	6.7	
Interest in Job	23.0	4.6	
Teaching Techniques	18.4	4.3	
Total Attitude Toward Teacher	66.1	13.6	

* $p < .01$; all t's were pooled variance except for Presentation of Subject, which was a separate variance t.

FOOTNOTES

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(2) Ibid, p. 196.

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(4) R.S. Soar. "Optimum-Teacher-Pupil Interaction for Pupil Growth." Educational Leadership. 26(3): 275-280, December 1968.

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(6) Herman Ohme. "Steps Toward Relevance: An Interest Centered Curriculum." Journal of Secondary Education. 45: 299-304, November 1970.

(7) R.R. Hayward. "Maximum Results from Mini-Courses." Today's Education. 58: 55-57, September 1969.

(8) Donald J. Gudaitis. "Mini-Courses: Are They Useful?" Clearing House. 46(8): 465-467, April, 1972.

(9) Goodwin Watson and Edward Glaser. Watson-Glaser Critical Thinking Appraisal. New York: Harcourt, Brace & World, 1951.

(10) Cooperative English Tests. Princeton: Educational Testing Service, 1960.

(11) R.K. Gable and A.D. Roberts. "The Development of an Instrument to Measure Attitudes Towards School Subjects." Paper presented at the Northeastern Educational Research Annual Meeting, Boston, Mass. 1972.

(12) J.R. Frymier. JIM Scale Student Questionnarie. The Ohio State University, Columbus, Ohio, 1965.

(13) J.R. Frymier. Development and Validation of a Motivation Index: A Sixth Report, The Ohio State University, Columbus, Ohio, 1965.

(14) See number 11 above.

(15) Copies of this instrument may be obtained from the authors.